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ASSOCIATIONS BETWEEN BIRTH WEIGHT AND BODY COMPOSITION IN LATER LIFE: PRELIMINARY FINDINGS FROM A BRITISH BIRTH COHORT STUDY

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Background The composition of the body (amount of fat and lean mass) has important implications for health and physical functioning and may be influenced by factors in early life. Studies have reported positive associations between birth weight, an indicator of prenatal growth, and lean mass in adolescence and adulthood. However, inconsistent findings have been reported between birth weight and fat mass, and few studies have been conducted in later adulthood.

Objectives To examine the associations of birth weight with fat and lean mass measured in later adulthood (60–64 years); to examine whether any associations found are independent of potential confounders/mediators (childhood socioeconomic circumstances, indicated by father's occupational class at age 4, and adult height).

Design Birth cohort study.

Setting England, Scotland and Wales.

Participants A subsample of 531 men and women from the Medical Research Council (MRC) National Survey of Health and Development, followed up since birth in March 1946 who attended two regional clinics (from a total of 6) where data collection was completed between 2008 and 2011.

Main outcome measures Whole body fat and lean mass (excluding the head), measured using dual energy X-ray absorptiometry at 60–64 years.

Results Birth weight was positively associated with lean mass in both sexes, with a modest increase in lean mass per 1 kg increase in birth weight of 1.71 kg in men (95% CI: 0.24 to 3.17) and 2.42 kg in women (95% CI: 1.07 to 3.76). These associations remained after adjustment for childhood socioeconomic circumstances in both sexes, but were largely attenuated after adjustment for adult height in men (β per kg increase in birth weight: 0.35 kg; 95% CI: –0.98 to 1.68), but not women (β : 1.29 kg; 95% CI: 0.12 to 2.45). Birth weight was not associated with fat mass in either sex, before or after adjustments.

Conclusions These findings suggest that prenatal growth affects lean mass, but not fat mass, in later adulthood. A high birth weight may reflect a greater number of muscle fibres attained at birth, which then track into adulthood. Attenuation of effect after adjustment for height suggests that this association is largely driven by increased body size in men, and additional factors in women. Optimal growth before birth may protect against the detrimental impacts of low muscle mass in later life.